



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/923,447	08/08/2001	Kunihiro Ueda	110262	9082

25944 7590 01/14/2004

OLIFF & BERRIDGE, PLC
P.O. BOX 19928
ALEXANDRIA, VA 22320

EXAMINER

CULBERT, ROBERTS P

ART UNIT

PAPER NUMBER

1763

DATE MAILED: 01/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/923,447

Applicant(s)

UEDA ET AL.

Examiner

Roberts Culbert

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 December 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-4,6-9 and 11-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-4,6-9 and 11-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 12/15/03 have been fully considered but they are not persuasive.

Applicant has argued that Matono teaches away from the use of wet etching by stating a preference for dry etching. The argument is not persuasive. A known process does not become patentable simply because it has been described as inferior to another process. Further, the argument is moot in view of the new rejection cited below.

Applicant has argued that relying on Official Notice to reject Claims 3, 4, 7-9 and 12-14 is improper. In view of the argument, the Official Notice of facts in the last office action is withdrawn.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 3, 4, 7, 8, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,174,736 to Tsukamoto.

Art Unit: 1763

Tsukamoto teaches a method of manufacturing a magnetoresistive device comprising the steps of forming a magnetoresistive film on a base the magnetoresistive film including a first ferromagnetic layer, a tunnel barrier layer and a second ferromagnetic layer; mechanically polishing an end face of the magnetoresistive film; and performing etching on the end face mechanically polished.

Tsukamoto does not explicitly teach that etching step may performed using wet etching. However Tsukamoto states (Col. 3, Lines 10-15) that *"the surfaces of the first ferromagnetic layer, the tunnel barrier layer, and the second ferromagnetic layer are first mechanically polished, and then the thus mechanically polished end surfaces are etched, preferably dry etched."* At the underlined portion of the quote above, Tsukamoto indicates that although dry etching is preferred, other etching methods are possible with the invention. Since the only other type of etching besides dry etching is wet etching, it would have been obvious to one of ordinary skill in the art at the time of invention to use wet etching in place of dry etching as Tsukamoto suggests that the surfaces may be etched by either method. The fact that Tsukamoto teaches that dry etching is preferred, is not the sort of teaching that would prevent one of ordinary skill in the art from making the substitution.

Regarding claims 4 and 8, Tsukamoto teaches the step of forming a current path for passing a current in a direction perpendicular to an extending surface of the magnetoresistive film, as this is an inherent feature in the operation of magnetic tunnel junction devices. When an electric potential is applied between the two ferromagnetic layers, the current flows perpendicular through the tunnel barrier layer, as one of ordinary skill in the art would appreciate.

Regarding Claim 9, Tsukamoto teaches forming a recording head on the base before the step of mechanically polishing the end face.

Claims 2 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,174,736 to Tsukamoto in view of U.S. Patent 5,687,045 to Okai.

As applied above, Tsukamoto teaches the method of the invention substantially as claimed, but does not teach the use of acid or alkali for polishing the end face of the MR film.

Art Unit: 1763

Okai teaches that a working fluid of pH 6-8 may be used to polish the air-bearing surface of a magnetic head. See Abstract. It would have been obvious to use a fluid of pH recommended by Okai in order to reduce pole top recessions on the air bearing surface as taught by Okai. Note that Okai uses the same layers as Tsukamoto in the formation of the magnetoresistive film. Al_2O_3 is used for the gap layer or tunnel barrier layer, and Ni-Fe is used for the ferromagnetic layers.

Claims 12, 13, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,174,736 to Tsukamoto in view of U.S. Patent 6,127,045 to Gill.

As applied above, Tsukamoto teaches the method of the invention substantially as claimed, but does not teach mounting the slider on a slider suspension.

Gill teaches that it is known in the art of fabricating magnetic heads to mount the slider having a reproducing head on a slider suspension (Col. 4, Lines 63-64). It would have been obvious to one of ordinary skill in the art at the time of invention to form the magnetic head in the conventional manner.

Regarding Claim 13, Tsukamoto teaches the step of forming a current path for passing a current in a direction perpendicular to an extending surface of the magnetoresistive film, as this is an inherent feature in the operation of magnetic tunnel junction devices. When an electric potential is applied between the two ferromagnetic layers, the current flows perpendicular through the tunnel barrier layer, as one of ordinary skill in the art would appreciate.

Regarding Claim 14, Tsukamoto teaches forming a recording head on the base before the step of mechanically polishing the end face.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,174,736 to Tsukamoto in view of U.S. Patent 6,127,045 to Gill and in further view of U.S. Patent 5,687,045 to Okai.

As applied above, Tsukamoto in view of Gill teaches the method of the invention substantially as claimed, but does not teach the use of acid or alkali for polishing the end face of the MR film.

Art Unit: 1763

Okai teaches that a working fluid of pH 6-8 may be used to polish the air-bearing surface of a magnetic head. See Abstract. It would have been obvious to use a fluid of pH recommended by Okai in order to reduce pole top recessions on the air bearing surface as taught by Okai. Note that Okai uses the same layers as Tsukamoto in the formation of the magnetoresistive film. Al_2O_3 is used for the gap layer or tunnel barrier layer, and Ni-Fe is used for the ferromagnetic layers.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Roberts Culbert whose telephone number is (571) 272-1433. The examiner can normally be reached on Monday-Friday (7:30-4:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on (571) 272-1439. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Application/Control Number: 09/923,447

Page 6

Art Unit: 1763

R. Culbert

R. Culbert

[Signature]
SUNSHINE
TECHNOLOGY CENTER 1760